

Galileo's Near Infrared Mapping Spectrometer (NIMS) Science Observations Designs for Europa.

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The Galileo spacecraft's eleven orbits provide an excellent opportunity for NLMS to study Europa over the 0.7 to 5.2 micron spectral range. NLMS will observe Europa's south pole during Jupiter orbit insertion and Europa's north pole in the eleventh and last orbit of the nominal mission. West longitudes 90 to 360 degrees will be observed during the first seven orbits, with a spatial resolution of 50-300 km. West longitudes 0 to 90 degrees will be observed at lower spatial resolution (poorer than 300 km) during the eighth through the tenth orbits.

NIMS's Europa spectral observations are grouped into three campaigns: polar mapping, global mapping, and high spectral and spatial resolution observations. The polar observations provide NIMS with a unique opportunity to detect frozen volatile species including water. The global mapping campaign will address the composition and distribution of surface materials, including chemical differences between the trailing and leading hemispheres. Global observations will also endeavor to understand global tectonism, such as plate motion, compositional differences between plates, and the origin, evolution and chemistry of the liquids that emerged from/near lineaments, craters and perhaps palimpsests. The mid-spatial and mid-spectral resolution observations have been planned to study resurfacing, exogenic processes (such as implantation of material from the magnetosphere) and tectonic processes. The high-spectral and high-spatial resolution observations seek to define compositional units, characterize their boundaries and relationships to tectonic features and identify species or minerals present on the icy surface of Europa. The Tyre Macula feature is one region that has been targeted as part of a high-spectral (408 wavelengths) and spatial (9-12 km/NIMS pixel) observation to understand its origin.

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